Space Weather Forecast

Issued on Wednesday, 20 March 2024 at 01:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Moderate flares likely (R1-R2 Radio blackouts), slight chance of strong flares (R3 blackouts). Chance of G1 from Coronal Mass Ejection arrivals mainly late Day 1 (20 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate, with the largest M-class flare peaking at 19/2327 UTC from a region in the southeast. There are currently eight sunspot regions on the visible disc. The two regions of most interest are both in the eastern hemisphere; one in the northeast (likely a region from the previous rotation which gave three Strong flares) which has a large main spot with clear magnetic complexity. The other is in the southeast and has many smaller spots, but is showing some smaller areas of magnetic complexity. A region in the southwest has steadied after earlier growth, developing some weak magnetic complexity. A new spot region has appeared on the southeastern limb. The remaining regions currently appear stable or showing slight decay.

No Earth directed Coronal Mass Ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds were at ambient to slightly elevated levels, around 400 km/s. Interplanetary Magnetic Field (IMF) was weak throughout. The north-south component was weakly southward directed at first after recent CME arrival, then varied weakly. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is now close to background levels following the S1 enhancement on 15-16 Mar.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is likely with a slight chance of becoming High with any isolated Strong flares, mostly due to the two regions in the east, but other regions in the west bear keeping an eye on.

Solar Wind / Geomagnetic Activity: A complex filament eruption on 17 Mar saw two possible Earth-directed CMEs. The arrivals of these are expected during the latter part of Day 1 (20 Mar) or into early Day 2 (21 Mar), perhaps arriving as two separate shocks but may also arrive together. The more likely impact is from the slower of the two CMEs, but perhaps also a glancing blow from the slightly faster and further south CME. Ongoing effects are possible during Day 2 (21 Mar), before then easing. Aside from the CMEs, no other sources of notable enhancement to solar winds are forecast.

Geomagnetic activity is expected to be Quiet to Unsettled (Kp1-3), with a chance of Active or G1/Minor Storm conditions (Kp4-5) late on Day 1 into Day 2 from the filament eruption CME from 17 Mar. Effects are then likely to decline through Day 2, becoming largely Quiet by Day 3 (22 Mar) in the absence of further CMEs.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Met Office Space Weather Forecast

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain around background levels, with a slight chance of further enhancements. This risk increases slightly through the period.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	30	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.